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TECHNICAL MEMORANDUM

DATE: March 25, 2011

TO: Mr. Carl Warren, WAM, EPA Region 9

FROM: Scott Ruth, Project Manager, Bristol Environmental Remediation Services, LLC

RE: EPA Contract No. EP-W-07-104
Work Assignment LS-003, LUST Site Assessments in Indian Country
Bond & Bond/NAV 046

Bristol Environmental Remediation Services, LLC (Bristol), has prepared this Technical Memorandum (Tech Memo) at the request of the U.S. Environmental Protection Agency (EPA). The Tech Memo provides the following information for the subject site, Bond & Bond (EPA ID NAV 046), located in Shiprock, New Mexico:

- Results of the July 2010 trench and used oil tank test pit excavations
- Results of the December 2010 groundwater sampling event, including water levels and analytical results

EXECUTIVE SUMMARY

The Bond & Bond site is located on the north side of U.S. Highway 64 in Shiprock, New Mexico, approximately one-quarter mile southwest of the intersection of U.S Highways 64 and 491. Bond & Bond is no longer operating at the site, and the former Bond & Bond building is occupied by a hardware store and a video rental store.

Three underground storage tanks (USTs) were removed from the site in 1993. Evidence of a petroleum release was noted at the time of UST removal. Nine monitoring wells were installed between 1993 and 2005. Four of the original nine monitoring wells can no longer be located.

The EPA assigned this site to Bristol under Work Assignment LS-003, Contract Number EP-W-07-104. In 2008, Bristol installed 11 additional monitoring wells at the site and characterized the extent of soil and groundwater contamination.

Exceedances of cleanup levels in soil include gasoline range organics (GRO), diesel range organics (DRO), and benzene. Exceedances of cleanup levels in groundwater include GRO and DRO. Sixteen monitoring wells are located on the site. Product was measured in two wells, up to a thickness of 0.16 feet. The direction of groundwater flow is to the west-southwest.

In July, a test pit was excavated in the location of the former used oil tank to collect soil samples to confirm that a release had not occurred. The soil samples did not contain concentrations of petroleum hydrocarbons at levels above screening levels.

Attachment 1 to this Tech Memo includes Tables 1 and 2, presenting water levels and groundwater analytical results. Attachment 2 includes Figures 1 through 8, depicting the site layout, groundwater contours, selected analytical results, and distribution of selected, individual contaminants.

SITE BACKGROUND

The Bond & Bond site is located in Shiprock, New Mexico, approximately one-quarter mile west of the junction of U.S. Highway 491, along U.S. Highway 64 (Attachment 2, Figure 1). The highway is an area of heavy traffic use. With a population of approximately 8,000, Shiprock is one of the more populated towns on the Navajo Nation. The area around the site is used for commercial and residential purposes. An operating hardware store and video rental store are located on the site (Attachment 2, Figure 2). A trailer home is located west of the site. A Bureau of Indian Affairs facility is located north of the site. Potential receptors include on-site or nearby commercial or residential buildings and the San Juan River. Activities that have been conducted at the site include the following:

- 1993 – Three USTs were removed and a petroleum release confirmed. Eight monitoring wells were installed. Soil contamination was identified, but none of the monitoring wells were found to contain groundwater contamination.

- June 2003 – A full round of groundwater sampling was conducted. Only seven of the original eight wells were located, and only four were found to contain groundwater. None of the four monitoring wells sampled were found to contain groundwater contamination above EPA maximum contaminant levels (MCLs).
- 2005 – One additional monitoring well (MW-7) was installed and a full round of groundwater sampling was conducted. One monitoring well (MW-1) was found to contain free product and another (MW-5) was found to be dry. Newly installed MW-7 was found to contain ethylbenzene above the EPA MCL.
- May 2008 – A full round of groundwater sampling was conducted.
- August 2008 – Seventeen soil borings were installed, nine of which were completed as monitoring wells MW-8 through MW-16.
- September 2008 – All nine newly installed monitoring wells (MW-8 through MW-16) were sampled.
- November 2008 – Six soil borings were installed, two of which were completed as monitoring wells MW-17 and MW-18.
- December 2008 – A full round of groundwater sampling was conducted.
- June 2009 – A full round of groundwater sampling was conducted.
- April 2010 – A full round of groundwater sampling was conducted.
- July 2010 – Trench excavation and used oil tank test pit excavation and soil sampling was conducted.
- December 2010 – A full round of groundwater sampling was conducted. Analytical results and water level measurements are presented in attached tables (Attachment 1) and figures (Attachment 2).

GENERAL SITE CONDITIONS

The site has been characterized and found to have petroleum contamination at concentrations exceeding cleanup levels for both soil and groundwater. Free product has historically been detected in MW-1 and was detected for the first time in MW-10 during the December 2010 sample event. Contaminants detected at the site include volatile organic compounds (VOCs), GRO, and DRO.

COMPLETED TASKS

TRENCH INSTALLATION

In July 2010 a trench was excavated in the area of the former UST located between the building and MW-1. The trench was excavated to groundwater in order to assess the vertical distribution of soil contamination in the area of the former tank location. The depth of the excavation was approximately 12 feet below ground surface (bgs). Contaminated soil was only encountered at the water table. The photoionization detector (PID) readings were taken from the four sidewalls at the bottom of the excavation. No soil samples were collected from the excavation for laboratory analysis. An additional test pit was excavated to the northwest of the first test pit to confirm the limited extent of the soil contamination. The second test pit was excavated to the water table at a depth of 12 feet bgs. The PID readings collected from the test pit did not detect VOCs. The locations of the test pits are shown on Figure 3.

USED OIL TANK TEST PIT

A test pit was excavated in the area of the former used oil UST. The test pit was excavated to a depth of approximately nine feet bgs where groundwater was encountered in order to assess if a release of petroleum hydrocarbons had occurred at the former tank location. The PID readings collected from the test pit did not detect VOCs. Two soil samples were collected and submitted for laboratory analysis to TestAmerica Laboratories, Inc. (TestAmerica) in Phoenix, Arizona. Soil samples were analyzed for PCBs by EPA Method 8082, SVOCs by EPA Method 8270C, VOCs by EPA Method 8260B, TPH by EPA Method 8015B (gasoline, diesel, and oil reported), and RCRA 8 metals by EPA Method 6010B/6020 (mercury by 7471A).

Diesel range organics, GRO, VOCs, SVOCs, and PCBs were not detected. No compounds were detected above established Navajo Nation Environmental Protection Agency (NNEPA) regulatory limits.

GROUNDWATER SAMPLING

In December 2010, a full round of groundwater sampling was conducted at the Bond & Bond site for ongoing monitoring purposes. MW-5 was found to be dry and was not sampled. Two monitoring wells contained free product (MW-1 and MW-10), but were also not sampled.

MW-16 was dry during the previous sampling event (April 2010), but was found to be destroyed (monument box and casing damaged) during the December sampling event. All 12 of the other monitoring wells at the site were sampled, and water levels were measured. Groundwater samples were submitted for laboratory analysis to TestAmerica. Samples were analyzed for GRO, DRO, and oil range organics using EPA Method 8015D, VOCs using EPA8260B, and 1,2-Dibromoethane (EDB) using EPA Solid Waste Test Method SW8011. Groundwater samples were found to exceed cleanup levels for DRO in wells MW-7, MW-8, and MW-9. Free product was found in wells MW-1 and MW-10. MW-9 was the only well that had GRO concentration exceeding the cleanup level. Groundwater analytical results are presented in attached tables (Attachment 2, Table 2). Figure 4 presents the groundwater elevation and contours for the December sampling. Figures 5, 6, and 7 present the groundwater analytical results.

Contaminant EDB has not been detected in groundwater at the site, and it is recommended that Method SW8011 for EDB be discontinued for future groundwater analytical sampling.

PLANNED OR PROPOSED ACTIVITIES

Based on discussion between the EPA, Bristol, and NNEPA, the following activities were discussed for implementation in 2011.

CONCEPTUAL SITE MODEL

Based on the data and information during the site characterization activities, petroleum-hydrocarbon contamination remains above established NNEPA screening levels at the site. The media of concern and potential exposure pathways and receptors for the site are described in the following sections.

SURFACE SOIL

Based on physical observations of the site surface soil and soil boring data, petroleum-hydrocarbon contamination does not appear to be present in the surface soil; therefore, surface soil does not pose a risk to current and future potential receptors.

SUBSURFACE SOIL

Subsurface soil analytical results from the site characterization soil borings indicate that petroleum-hydrocarbon contamination exists at the site at concentrations above NNEPA screening levels.

Contaminated soil is present in a zone at the groundwater table. The contamination present is primarily DRO and GRO. Benzene was detected in one soil sample from MW-10 at a concentration of 0.47 milligrams per kilogram (mg/kg), which is greater than the NNEPA screening level of 0.13 mg/kg but less than the EPA regional screening level of 1.1 mg/kg. Figure 8 presents the soil analytical data.

While petroleum hydrocarbons remain in subsurface soils at the site, the contamination is present at depths where exposure to future potential receptors is limited and unlikely. The most likely exposure would be to construction workers at the site. Vapor intrusion into future buildings constructed on site is not likely, given the depth of the remaining contamination.

GROUNDWATER

Groundwater sampling of monitoring wells on the site shows that VOCs are not present in groundwater at levels above MCLs. Diesel range organics and GRO are present in groundwater at the site. Product has been found in two wells at the site. This product is not likely to be mobile. Vapor intrusion into future buildings constructed on site is not likely, given the lack of VOCs and the depth to groundwater. Water is supplied to all the buildings on the site by a public water supply, and groundwater on site is not used.

SURFACE WATER

Based on the site characterization data, migration of contaminants to surface water (San Juan River) has not occurred.

RISK ASSESSMENT

Based on the site characterization data and groundwater monitoring data, it is recommended that a human health risk assessment be performed to evaluate the need for further remedial action at the site.

2011 Groundwater Sampling

Groundwater sampling occurred twice (spring and fall) in 2010. The need for future groundwater sampling at the site will be evaluated following the risk assessment.

Schedule Summary

Activity	Month/Year	Tentative Start Date
Risk Assessment	To be determined	To be determined

ATTACHMENT 1

Tables

Table 1 Static Water Level Measurements for Bond & Bond (NAV 046)

Table 2 Current and Historical Groundwater Analytical Results

Table 1 Static Water Level Measurements for Bond & Bond (NAV 046)

Well Name	TOC Elevation (feet above MSL)	Measurement Date	Depth to NAPL (feet)	Depth to Water (feet)	NAPL Thickness (feet)	SWL Elevation (feet above MSL)
MW-1	4896.26	6/16/2003	--	11.35	--	4884.91
		5/21/2008	NR	10.78	NR	4885.48
		9/2/2008	--	10.39	--	4885.87
		12/5/2008	12.15	12.18	0.03	4884.10*
		6/17/2009	--	11.34	--	4884.92
		4/7/2010	--	11.58	--	4884.68
		12/8/2010	12.08	12.24	0.16	4884.02
MW-4	4895.95	6/16/2003	--	10.96	--	4884.99
		5/21/2008	--	10.39	--	4885.56
		9/2/2008	--	11.81	--	4884.14
		12/5/2008	--	11.80	--	4884.15
		6/17/2009	--	11.03	--	4884.92
		4/7/2010	--	11.28	--	4884.67
		12/8/2010	--	11.78	--	4884.17
MW-5	4894.46	6/16/2003	--	11.90	--	4882.56
		9/2/2008	--	10.35	--	4884.11
		12/5/2008	--	10.04	--	4884.42
		6/17/2009	--	--	--	--
		4/7/2010	--	DRY	--	--
		12/8/2010	--	DRY	--	--
MW-6	4895.15	6/16/2008	--	10.63	--	4884.52
		5/21/2008	--	9.93	--	4885.22
		9/2/2008	--	11.32	--	4883.83
		12/5/2008	--	11.35	--	4883.80
		6/17/2009	--	10.53	--	4884.62
		4/7/2010	--	10.87	--	4884.28
		12/8/2010	--	11.32	--	4883.83
MW-7	4896.21	5/21/2008	--	10.81	--	4885.40
		9/2/2008	--	13.22	--	4882.99
		12/5/2008	--	12.15	--	4884.06
		6/17/2009	--	11.37	--	4884.84
		4/7/2010	--	11.61	--	4884.60
		12/8/2010	--	12.13	--	4884.08
MW-8	4895.26	9/2/2008	--	11.27	--	4883.99
		12/5/2008	--	11.23	--	4884.03
		6/17/2009	--	10.43	--	4884.83
		4/7/2010	--	10.65	--	4884.61
		12/8/2010	--	11.19	--	4884.07
MW-9	4895.85	9/2/2008	--	11.98	--	4883.87
		12/5/2008	--	11.90	--	4883.95
		6/17/2009	--	11.05	--	4884.80
		4/7/2010	--	11.34	--	4884.51
		12/8/2010	--	11.82	--	4884.03

Table 1 Static Water Level Measurements for Bond & Bond (NAV 046) (continued)

Well Name	TOC Elevation (feet above MSL)	Measurement Date	Depth to NAPL (feet)	Depth to Water (feet)	NAPL Thickness (feet)	SWL Elevation (feet above MSL)
MW-10	4895.22	9/2/2008	--	11.24	--	4883.98
		12/5/2008	--	11.27	--	4883.95
		6/17/2009	--	10.46	--	4884.76
		4/7/2010	--	10.74	--	4884.48
		12/8/2010	11.21	11.33	0.12	4883.89
MW-11	4891.59	9/2/2008	--	7.85	--	4883.74
		12/5/2008	--	7.82	--	4883.77
		6/17/2009	--	7.05	--	4884.54
		4/7/2010	--	7.27	--	4884.32
		12/8/2010	--	7.80	--	4883.79
MW-12	4896.17	9/2/2008	--	11.96	--	4884.21
		12/5/2008	--	11.92	--	4884.25
		6/17/2009	--	11.16	--	4885.01
		4/7/2010	--	11.34	--	4884.83
		12/8/2010	--	11.90	--	4884.27
MW-13	4895.65	9/2/2008	--	11.28	--	4884.37
		12/5/2008	--	11.33	--	4884.32
		6/17/2009	--	10.60	--	4885.05
		4/7/2010	--	10.83	--	4884.82
		12/8/2010	--	11.37	--	4884.28
MW-14	4892.09	9/2/2008	--	8.02	--	4884.07
		12/5/2008	--	8.03	--	4884.06
		6/17/2009	--	7.22	--	4884.87
		4/7/2010	--	7.42	--	4884.67
		12/8/2010	--	7.96	--	4884.13
MW-15	4892.76	9/2/2008	--	8.73	--	4884.03
		12/5/2008	--	8.73	--	4884.03
		6/17/2009	--	7.96	--	4884.80
		4/7/2010	--	8.16	--	4884.60
		12/8/2010	--	8.71	--	4884.05
MW-16	4892.71	9/2/2008	--	8.75	--	4883.96
		12/5/2008	--	8.77	--	4883.94
		6/17/2009	--	7.96	--	4884.75
		4/7/2010	--	DRY	--	--
		12/8/2010	Destroyed			--
MW-17	4895.15	12/5/2008	--	11.12	--	4884.03
		6/17/2009	--	10.29	--	4884.86
		4/7/2010	--	10.63	--	4884.52
		12/8/2010	--	11.07	--	4884.08
MW-18	4892.66	12/5/2008	--	8.66	--	4884.00
		6/17/2009	--	7.86	--	4884.80
		4/7/2010	--	8.06	--	4884.60
		12/8/2010	--	8.62	--	4884.04

Notes:

-- = not applicable (NAPL not present in well)

* = SWL elevation corrected for NAPL using factor of 0.8

MSL = mean sea level

NAPL = non-aqueous phase liquid

NR = not recorded

SWL = static water level

TOC = top of casing

Table 2 Current and Historical Groundwater Analytical Results

Location	Sample Identification	Sample Date	GRO (µg/L) Result	DRO (µg/L) Result	Benzene (µg/L) Result	Toluene (µg/L) Result	Ethylbenzene (µg/L) Result	Xylenes (µg/L) Result	EDB (µg/L) Result	MTBE (µg/L) Result	Lead (mg/L) Result
NNEPA MCL[1]			**304***	**328***	**5**	**1,000**	**700**	**10,000**	**0.05**	**12****	**0.015**
MW-1	MW-1	6/16/2003	--	--	ND	ND (1.0)	ND (1.0)	ND	ND (1.0)	ND (1.0)	--
		8/12/2005	**Not Sampled, NAPL Present**								
		5/21/2008									
		12/5/2008									
		6/17/2009	**320 J**	**150,000 J**	ND (5.0)	18	ND (5.0)	ND (5.0)	ND (0.02)	ND (5.0)	--
		4/7/2010	**1,200 J**	**700,000 J**	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.01966)	ND (0.50)	--
		12/9/2010	**Not Sampled, NAPL Present**								
MW-4	MW-4	6/16/2003	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	--
		8/15/2005	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (1.0)	--	ND (1.0)	ND (0.010)
		5/21/2008	ND (200)	ND (110) UJL	ND (0.50)	ND (0.50)	ND (0.50)	32.1	ND (0.0199)	ND (2.0)	ND (0.010)
		12/5/2008	ND (200)	ND (100)	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0096)	ND (2.0)	--
		6/17/2009	ND (200)	ND (100)	ND (0.50)	ND (2.0)	ND (0.50)	ND (1.0)	ND (0.02)	ND (0.50)	--
		4/7/2010	ND (200)	ND (100)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.01989)	ND (0.50)	--
		12/9/2010	ND (200)	ND (100) UJ	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.019)	ND (0.50)	--
MW-5	MW-5	6/16/2003	--	--	ND (1.0)	ND (1.0)	1.74	1.9	ND (1.0)	ND (1.0)	--
		8/15/2005	**Not Sampled, Well Dry**								
		5/21/2008									
		12/5/2008									
		6/17/2009									
		4/7/2010									
		12/9/2010									
MW-6	MW-6	6/16/2003	--	--	1.38	ND (1.0)	1.86	ND (1.0)	ND (1.0)	ND (1.0)	--
		8/15/2005	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (1.0)	--	ND (1.0)	ND (0.010)
		5/21/2008	ND (200)	220 JL	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.5)	ND (0.0199)	ND (2.0)	ND (0.010)
		12/5/2008	ND (200)	ND (100)	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0095)	ND (2.0)	--
		6/17/2009	ND (200)	ND (100)	ND (0.50)	ND (2.0)	ND (0.50)	ND (1.0)	ND (0.02)	ND (0.50)	--
		4/7/2010	ND (200)	ND (100)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.001961)	ND (0.50)	--
		12/9/2010	ND (200)	150 JH	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.50)	ND (0.50)	--
	MW-20 DUP†	12/9/2010	ND (200)	ND (120) J	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.020)	ND (0.50)	--
MW-7		8/15/2005	--	--	3.3	3.5	**1,120**	675.6	--	2.8	ND (0.010)
	MW-7	5/21/2008	**1,900**	**1,100 JL**	1.2	3.2	130	6.5	ND (0.0201)	ND (2.0)	ND (0.010)
	MW-7 DUP†	5/21/2008	**2,100**	**840 JL**	1.1	3.3	110	5.8	ND (0.0199)	ND (2.0)	ND (0.010)
		12/5/2008	280 J	ND (100)	ND (0.50)	ND (2.0)	21	ND (3.0)	ND (0.0096)	ND (2.0)	--
		6/17/2009	**3,200 JH**	**2,900 J**	ND (0.50)	ND (0.50)	16 JL	1	ND (0.02)	ND (0.50)	--
	MW-7	4/7/2010	**1,200 JH**	**1,300 J**	ND (0.50)	ND (0.50)	8.1 J	ND (1.0)	ND (0.01994)	ND (0.50)	--
	MW-20†	4/7/2010	**2,100 JH**	**1,600 J**	ND (0.50)	ND (0.50)	3.4 J	ND (1.0)	ND (0.02096)	ND (0.50)	--
	MW-7	12/9/2010	ND (200)	**440 J**	ND (0.50)	ND (0.50)	2.9 J	ND (1.0)	ND (0.020)	ND (0.50)	--
	MW-21†	12/9/2010	ND (200)	**740 JL**	ND (0.50)	ND (0.50)	2.1 J	ND (1.0)	ND (0.020)	ND (0.50)	--

Table 2 Current and Historical Groundwater Analytical Results (continued)

Location	Sample Identification	Sample Date	GRO (µg/L) Result	DRO (µg/L) Result	Benzene (µg/L) Result	Toluene (µg/L) Result	Ethylbenzene (µg/L) Result	Xylenes (µg/L) Result	EDB (µg/L) Result	MTBE (µg/L) Result	Lead (mg/L) Result
NNEPA MCL[1]			**304***	**328***	**5**	**1,000**	**700**	**10,000**	**0.05**	**12****	**0.015**
MW-8	MW-8	9/2/2008	**1,000 JH**	**19,000 JL**	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0209)	ND (2.0)	ND (0.010)
		12/5/2008	ND (200)	**5,300 J**	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0096)	ND (2.0)	--
		6/17/2009	**420 JL**	**7,400 J**	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.02)	ND (0.50)	--
		4/7/2010	**330 J**	**8,800 J**	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.01994)	ND (0.50)	--
		12/8/2010	ND (200)	**1,200 J**	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.020)	ND (0.50)	--
MW-9	MW-9	9/2/2008	**2,800 JH**	**850 JL**	ND (5.0)	ND (20)	250	85	ND (0.0200)	ND (20)	ND (0.010)
		12/5/2008	**1,100 J**	**350 J**	ND (0.50)	ND (2.0)	92	8.4	ND (0.0096)	ND (2.0)	--
		6/17/2009	**1,200 JH**	**1,600 J**	ND (5.0)	ND (5.0)	81 J	11	ND (0.02)	ND (5.0)	--
		4/7/2010	**1,000 JH**	310 J	ND (0.50)	ND (0.50)	14 J	3.9	ND (0.01961)	ND (0.50)	--
		12/9/2010	**900 JH**	**910 J**	ND (0.50)	ND (0.50)	18 J	3.1	ND (0.019)	ND (0.50)	--
MW-10	MW-10	9/2/2008	**4,900 JH**	**400 JL**	ND (0.50)	ND (2.0)	5.3	ND (3.0)	ND (0.0205)	ND (2.0)	ND (0.010)
		12/5/2008	**400 J**	120 J	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0095)	ND (2.0)	--
	MW-21[†]	12/5/2008	**1,200 J**	200 J	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0100)	ND (2.0)	--
	MW-10	6/17/2009	**7,000 JH**	**66,000 J**	ND (5.0)	ND (5.0)	13 J	ND (10)	ND (0.02)	ND (5.0)	--
		4/7/2010	**5,100 JH**	**80,000 J**	ND (0.50)	ND (0.50)	5.1 J	ND (1.0)	ND (0.01977)	ND (0.50)	--
	MW-21[†]	4/7/2010	**7,900 JH**	**29,000 J**	ND (0.50)	ND (0.50)	7.4 J	ND (1.0)	ND (0.01983)	ND (0.50)	--
		12/9/2010	**Not Sampled, NAPL Present**								
MW-11	MW-11	9/2/2008	ND (200)	150 JL	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0203)	ND (2.0)	ND (0.010)
		12/5/2008	ND (200)	ND (100)	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0096)	ND (2.0)	--
		6/17/2009	ND (200)	190 J	ND (0.50)	ND (2.0)	ND (0.50)	ND (1.0)	ND (0.02)	ND (5.0)	--
		4/7/2010	ND (200)	ND (100)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.001961)	ND (0.50)	--
		12/8/2010	ND (200)	ND (100) UJL	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.020)	ND (0.50)	--
MW-12	MW-12	9/2/2008	ND (200)	ND UJL	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0201)	ND (2.0)	ND (0.010)
		12/5/2008	ND (200)	ND (100)	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0096)	ND (2.0)	--
		6/17/2009	ND (200)	ND (100)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.02)	ND (5.0)	--
		4/7/2010	ND (200)	ND (100)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.01977)	ND (0.50)	--
		12/8/2010	ND (200)	ND (100) UJL	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.020)	ND (0.50)	--
MW-13	MW-13	9/2/2008	ND (200)	ND UJL	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0200)	ND (2.0)	ND (0.010)
		12/5/2008	ND (200)	ND (100)	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0097)	ND (2.0)	--
		6/17/2009	ND (200)	ND (100)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.02)	ND (5.0)	--
		4/7/2010	ND (200)	130 J	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.01966)	ND (0.50)	--
		12/8/2010	ND (200)	ND (100) UJL	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.020)	ND (0.50)	--
MW-14	MW-14	9/2/2008	ND (200)	180 JL	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0203)	ND (2.0)	ND (0.010)
		12/5/2008	ND (200)	ND (100)	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0095)	ND (2.0)	--
	MW-22[†]	12/5/2008	ND (200)	ND (100)	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0096)	ND (2.0)	--
	MW-14	6/17/2009	ND (200)	ND (100)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.02)	ND (5.0)	--
		4/7/2010	ND (200)	ND (100)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.01972)	ND (0.50)	--
		12/8/2010	ND (200)	ND (100) UJL	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.020)	ND (0.50)	--

Table 2 Current and Historical Groundwater Analytical Results (continued)

Location	Sample Identification	Sample Date	GRO (µg/L) Result	DRO (µg/L) Result	Benzene (µg/L) Result	Toluene (µg/L) Result	Ethylbenzene (µg/L) Result	Xylenes (µg/L) Result	EDB (µg/L) Result	MTBE (µg/L) Result	Lead (mg/L) Result
NNEPA MCL[1]			**304***	**328***	**5**	**1,000**	**700**	**10,000**	**0.05**	**12****	**0.015**
MW-15	MW-15	9/2/2008	ND (200)	**5,700 JL**	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0206)	ND (2.0)	ND (0.010)
		12/5/2008	ND (200)	**850 J**	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0096)	ND (2.0)	--
		6/17/2009	ND (200)	**770 J**	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.02)	ND (5.0)	--
		4/7/2010	ND (200)	**2,200 J**	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.01994)	ND (0.50)	--
		12/8/2010	ND (200)	**390 JL**	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.020)	ND (0.50)	--
MW-16	MW-16	9/2/2008	ND (200)	**340 JL**	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0208)	ND (2.0)	ND (0.010)
		12/5/2008	ND (200)	ND (100)	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0096)	ND (2.0)	--
		6/17/2009	ND (200)	120 J	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.02)	ND (5.0)	--
		4/7/2010	Not Sampled, Well Dry								
		12/8/2010	Not Sampled, Well Destroyed								
MW-17	MW-17	12/5/2008	ND (200)	ND (100)	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0096)	ND (2.0)	--
		6/17/2009	ND (200)	ND (100)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.02)	ND (5.0)	--
		4/7/2010	ND (200)	ND (100)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.01983)	ND (0.50)	--
		12/9/2010	ND (200)	ND (100) UJL	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.020)	ND (0.50)	--
MW-18	B-19-W	11/17/2008	--	150	--	--	--	--	--	--	--
	MW-18	12/5/2008	ND (200)	ND (100)	ND (0.50)	ND (2.0)	ND (2.0)	ND (3.0)	ND (0.0095)	ND (2.0)	--
		6/17/2009	ND (200)	ND (100)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.02)	ND (5.0)	--
		4/7/2010	ND (200)	ND (100)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.01994)	ND (0.50)	--
		12/8/2010	ND (200)	ND (100) UJL	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.020)	ND (0.50)	--

Notes:

Bold values exceed MCLs.

[1]Safe Drinking Water Act. The NNEPA uses the MCLs established by the EPA.

-- = not analyzed

* = NNEPA has not established MCL for DRO or GRO. The associated values are cleanup levels proposed by EPA Region 9.

** = NNEPA has not established MCL for MTBE. The associated value is an EPA RSL.

† = indicates duplicate sample

µg/L = micrograms per liter

DRO = diesel range organics

EDB = 1,2-Dibromoethane

EPA = U.S. Environmental Protection Agency

GRO = gasoline range organics

MCL = maximum contaminant level

mg/L = milligrams per liter

MTBE = methyl tert-butyl ether

NAPL = non-aqueous phase liquid

ND = not detected

NNEPA = Navajo Nation Environmental Protection Agency

RSL = regional screening level

Data Flags:

J = the associated value is an estimated quantity

JH = the associated value is an estimated quantity with a potential high bias

JL = the associated value is an estimated quantity with a potential low bias

UJL = the associated value is an estimated non-detect

ATTACHMENT 2

Figures

Figure 1 Site Location

Figure 2 Site Map

Figure 3 July 2010 Excavations

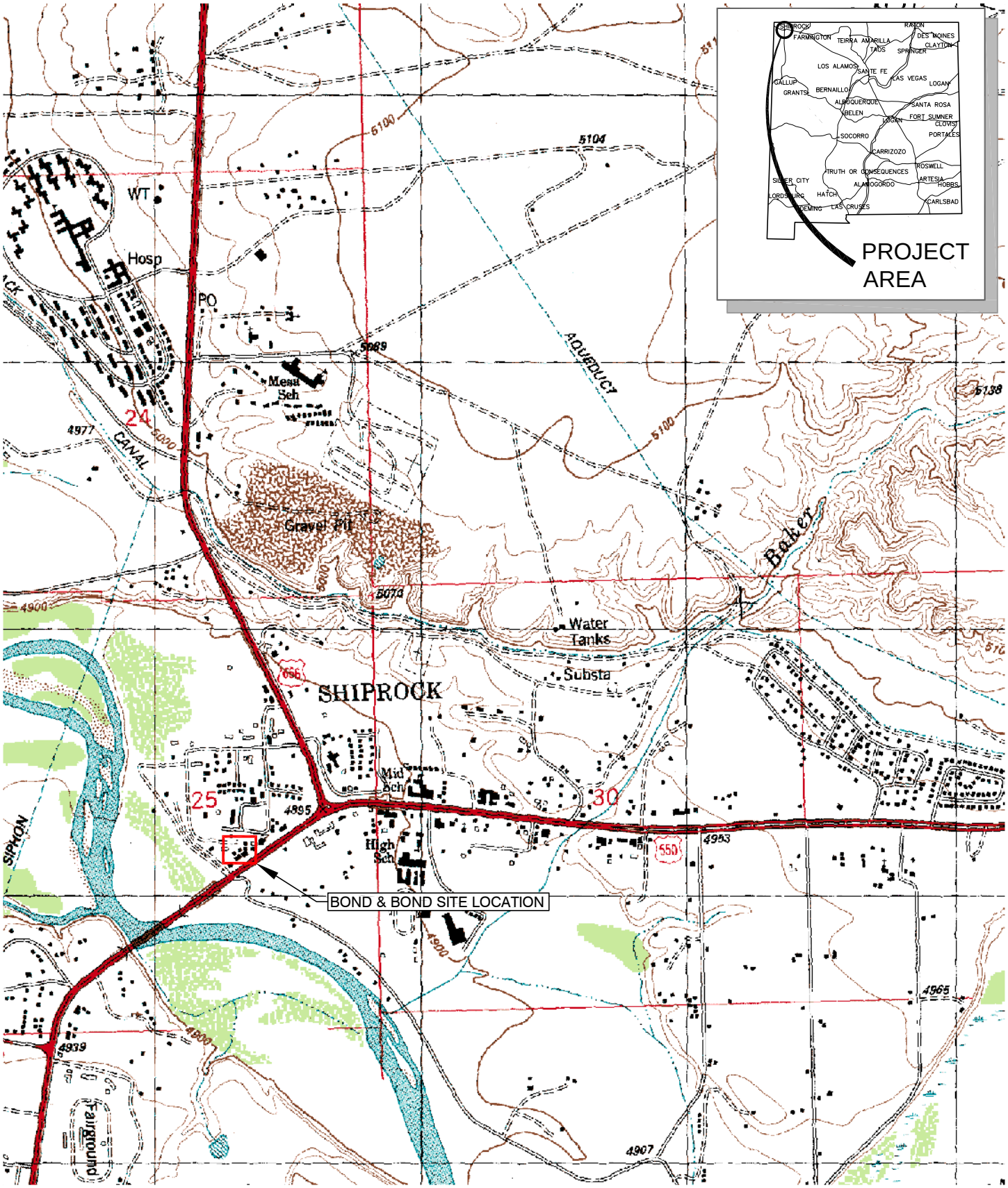
Figure 4 December 2010 Groundwater Elevations and Contours

Figure 5 December 2010 Groundwater Analytical Results

Figure 6 Extent of GRO in Groundwater Exceeding Cleanup Level

Figure 7 Extent of DRO in Groundwater Exceeding Cleanup Level

Figure 8 Soil Analytical Results



TOPO REFERENCE
Coolidge Dam (AZ) Topo Quad
Orig Date: 1991
Quad series: 7.5'
Paper source: Topographic 1:24,000

N

0 250 500
SCALE IN FEET

FIGURE 1
BOND & BOND (NAV 046)
SHIPROCK, NEW MEXICO
SITE LOCATION

Bristol
ENVIRONMENTAL
REMEDIATION SERVICES, LLC
Phone (907) 563-0013 Fax (907) 563-6713
Project No. 410054

DATUM:	NA
PROJECTION:	NA
DATE	03/22/11
DWN.	MTG
SCALE	SHOWN
APPRVD.	JSR

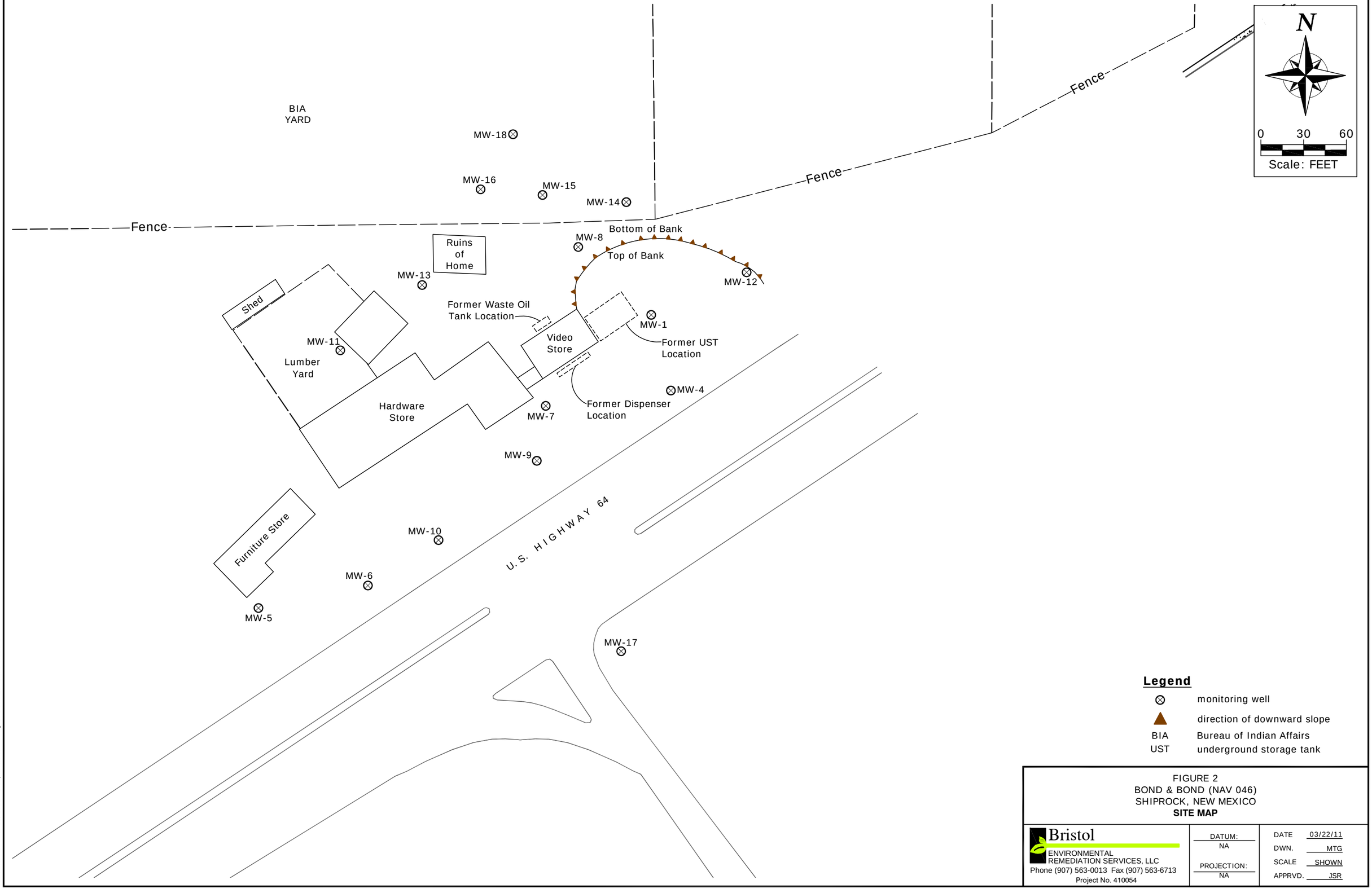


FIGURE 2
BOND & BOND (NAV 046)
SHIPROCK, NEW MEXICO
SITE MAP

Bristol
ENVIRONMENTAL
REMEDIATION SERVICES, LLC
Phone (907) 563-0013 Fax (907) 563-6713
Project No. 410054

DATUM: NA
PROJECTION: NA

DATE 03/22/11
DWN. MTG
SCALE SHOWN
APPRVD. JSR

MW-16

MW-15

MW-14

Bottom of Bank

N

0 10 20

Scale: FEET

Ruins
of
Home

MW-8

Top of Bank

0 0 0 0

MW-12

MW-13

Oil Tank Excavation to 9 Feet
(With PID Readings in PPM)

0 0 0 0 0 0

Former Waste Oil
Tank Location

87 65 120 93

Main Excavations to 12 Feet
(With PID Readings in PPM)

MW-1

Video
Store

Former UST
Location

Hardware Store

MW-4

MW-7

Former Dispenser
Location

U.S. HIGHWAY 64

MW-9

Legend

⊗ monitoring well

▲ direction of downward slope

PID photoionization detector

ppm parts per million

UST underground storage tank

FIGURE 3
BOND & BOND (NAV 046)
SHIPROCK, NEW MEXICO
JULY 2010 EXCAVATIONS

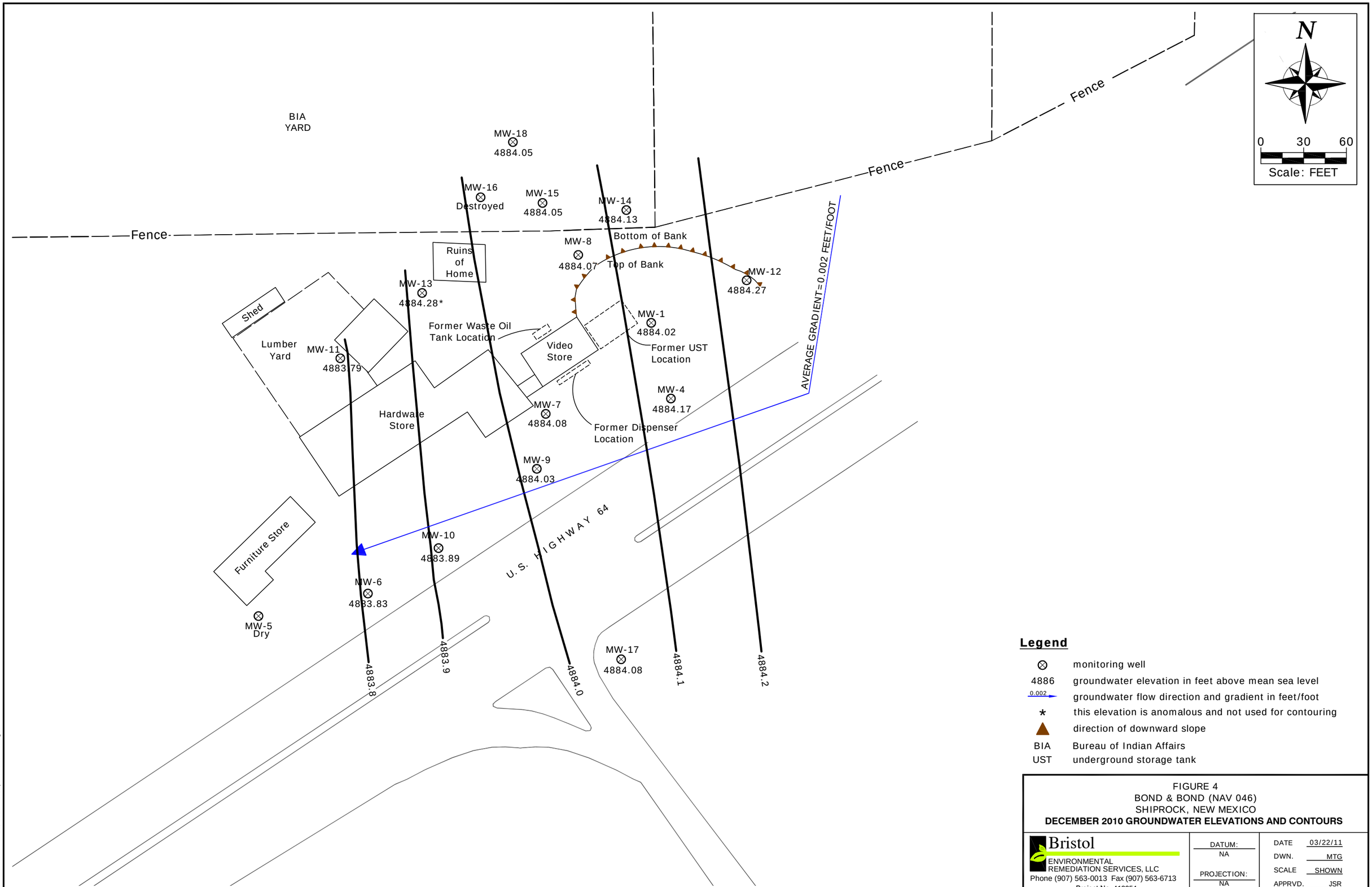
Bristol
ENVIRONMENTAL
REMEDIATION SERVICES, LLC
Phone (907) 563-0013 Fax (907) 563-6713
Project No. 410054

DATUM: NA

PROJECTION: NA

DATE 03/11/11
DWN. MTG
SCALE SHOWN
APPRVD. SR

Drawing: O:\JOBS\410054 EPA LS003 BOND\ACAD-ENVIRO\FIGURES-MAR11\410054-FIG3-REV-MAR11.DWG - Layout: 410052-FIG3-MAR11
User: MGARCIA Mar 25, 2011 - 3:06pm Xrefs: - Images: DOWNLOAD.JPG FIG2-IMAGE.JPG TILE.JPG



Legend

⊗	monitoring well
4886	groundwater elevation in feet above mean sea level
0.002 →	groundwater flow direction and gradient in feet/foot
*	this elevation is anomalous and not used for contouring
▲	direction of downward slope
BIA	Bureau of Indian Affairs
UST	underground storage tank

FIGURE 4
BOND & BOND (NAV 046)
SHIPROCK, NEW MEXICO
DECEMBER 2010 GROUNDWATER ELEVATIONS AND CONTOURS

Bristol
ENVIRONMENTAL
REMEDIATION SERVICES, LLC
Phone (907) 563-0013 Fax (907) 563-6713
Project No. 410054

DATUM: NA
PROJECTION: NA

DATE 03/22/11
DWN. MTG
SCALE SHOWN
APPRVD. JSR

Drawing: O:\JOBS\410054 EPA LS003 BOND\ACAD-ENVIRO\FIGURES-MAR11\410054-FIG4-REV-MAR11.DWG - Layout: 410054-FIG4-REV-MAR11
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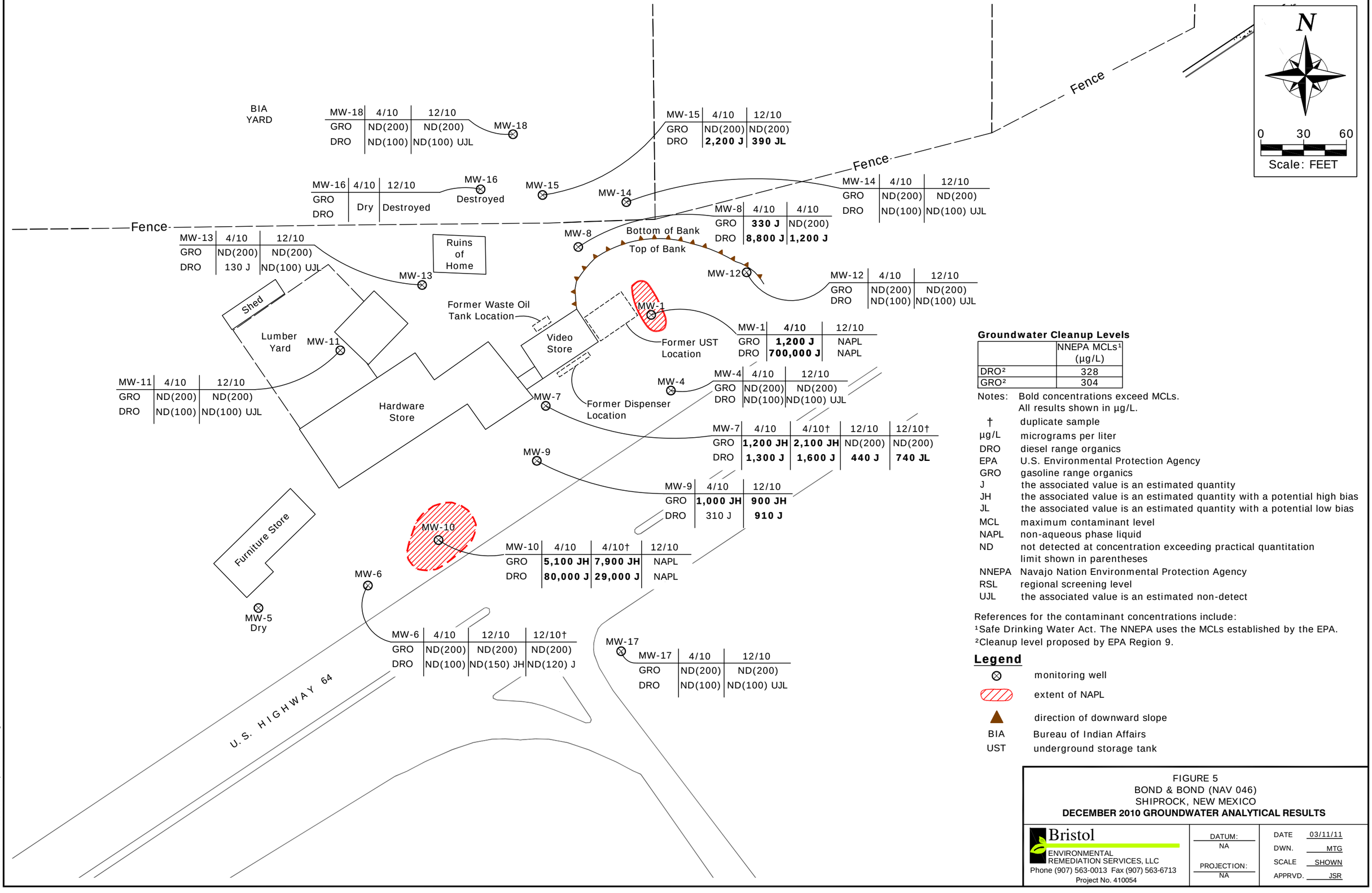

Groundwater Cleanup Levels

	NNEPA MCLs[1] (µg/L)
DRO[2]	328
GRO[2]	304

Notes: Bold concentrations exceed MCLs.
All results shown in µg/L.

†	duplicate sample
µg/L	micrograms per liter
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
GRO	gasoline range organics
J	the associated value is an estimated quantity
JH	the associated value is an estimated quantity with a potential high bias
JL	the associated value is an estimated quantity with a potential low bias
MCL	maximum contaminant level
NAPL	non-aqueous phase liquid
ND	not detected at concentration exceeding practical quantitation limit shown in parentheses
NNEPA	Navajo Nation Environmental Protection Agency
RSL	regional screening level
UJL	the associated value is an estimated non-detect

References for the contaminant concentrations include:
[1]Safe Drinking Water Act. The NNEPA uses the MCLs established by the EPA.
[2]Cleanup level proposed by EPA Region 9.

Legend

- monitoring well
- extent of NAPL
- direction of downward slope
- BIA — Bureau of Indian Affairs
- UST — underground storage tank

FIGURE 5
BOND & BOND (NAV 046)
SHIPROCK, NEW MEXICO
DECEMBER 2010 GROUNDWATER ANALYTICAL RESULTS

Bristol
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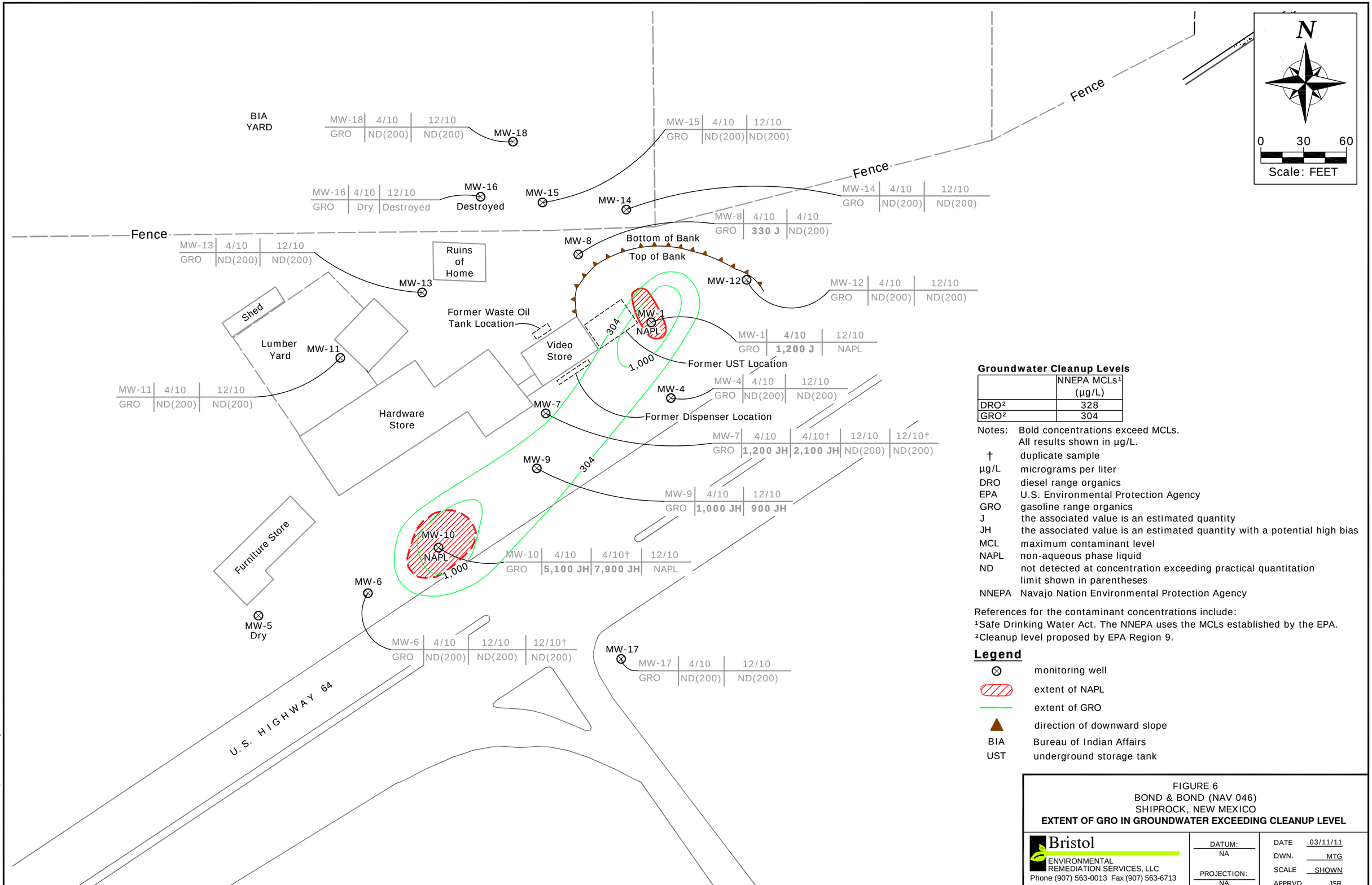
Project No. 410054

DATUM: NA
PROJECTION: NA
DATE 03/11/11
DWN. MTG
SCALE SHOWN
APPRVD. JSR



Groundwater Cleanup Levels

	NNEPA MCLs[1] (µg/L)
DRO[2]	328
GRO[2]	304

Notes: Bold concentrations exceed MCLs.
All results shown in µg/L.

†	duplicate sample
µg/L	micrograms per liter
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
GRO	gasoline range organics
J	the associated value is an estimated quantity
JH	the associated value is an estimated quantity with a potential high bias
MCL	maximum contaminant level
NAPL	non-aqueous phase liquid
ND	not detected at concentration exceeding practical quantitation limit shown in parentheses
NNEPA	Navajo Nation Environmental Protection Agency

References for the contaminant concentrations include:
[1]Safe Drinking Water Act. The NNEPA uses the MCLs established by the EPA.
[2]Cleanup level proposed by EPA Region 9.

Legend

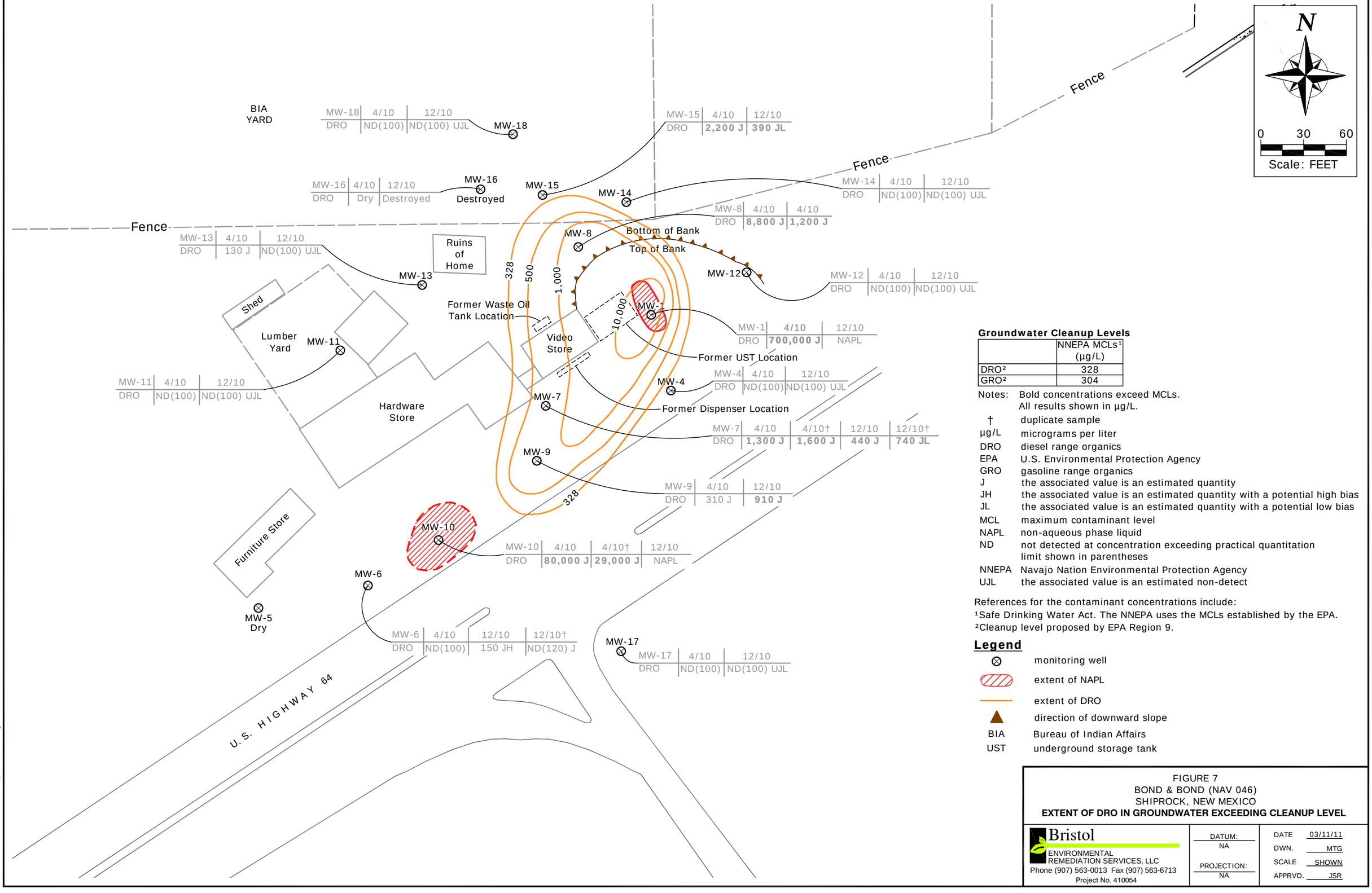
- monitoring well
- extent of NAPL
- extent of GRO
- direction of downward slope
- BIA — Bureau of Indian Affairs
- UST — underground storage tank

FIGURE 6
BOND & BOND (NAV 046)
SHIPROCK, NEW MEXICO
EXTENT OF GRO IN GROUNDWATER EXCEEDING CLEANUP LEVEL

Bristol
ENVIRONMENTAL REMEDIATION SERVICES, LLC
Phone (907) 563-0013 Fax (907) 563-6713
Project No. 410054

DATUM: NA
PROJECTION: NA

DATE 03/11/11
DWN. MTG
SCALE SHOWN
APPRVD. JSR



Groundwater Cleanup Levels

	NNEPA MCLs[1] (µg/L)
DRO[2]	328
GRO[2]	304

Notes: Bold concentrations exceed MCLs.
All results shown in µg/L.

†	duplicate sample
µg/L	micrograms per liter
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
GRO	gasoline range organics
J	the associated value is an estimated quantity
JH	the associated value is an estimated quantity with a potential high bias
JL	the associated value is an estimated quantity with a potential low bias
MCL	maximum contaminant level
NAPL	non-aqueous phase liquid
ND	not detected at concentration exceeding practical quantitation limit shown in parentheses
NNEPA	Navajo Nation Environmental Protection Agency
UJL	the associated value is an estimated non-detect

References for the contaminant concentrations include:
[1]Safe Drinking Water Act. The NNEPA uses the MCLs established by the EPA.
[2]Cleanup level proposed by EPA Region 9.

Legend

- monitoring well
- extent of NAPL
- extent of DRO
- direction of downward slope
- BIA Bureau of Indian Affairs
- UST underground storage tank

FIGURE 7
BOND & BOND (NAV 046)
SHIPROCK, NEW MEXICO
EXTENT OF DRO IN GROUNDWATER EXCEEDING CLEANUP LEVEL

Bristol ENVIRONMENTAL REMEDIATION SERVICES, LLC
Phone (907) 563-0013 Fax (907) 563-6713
Project No. 410054

DATUM: NA
PROJECTION: NA

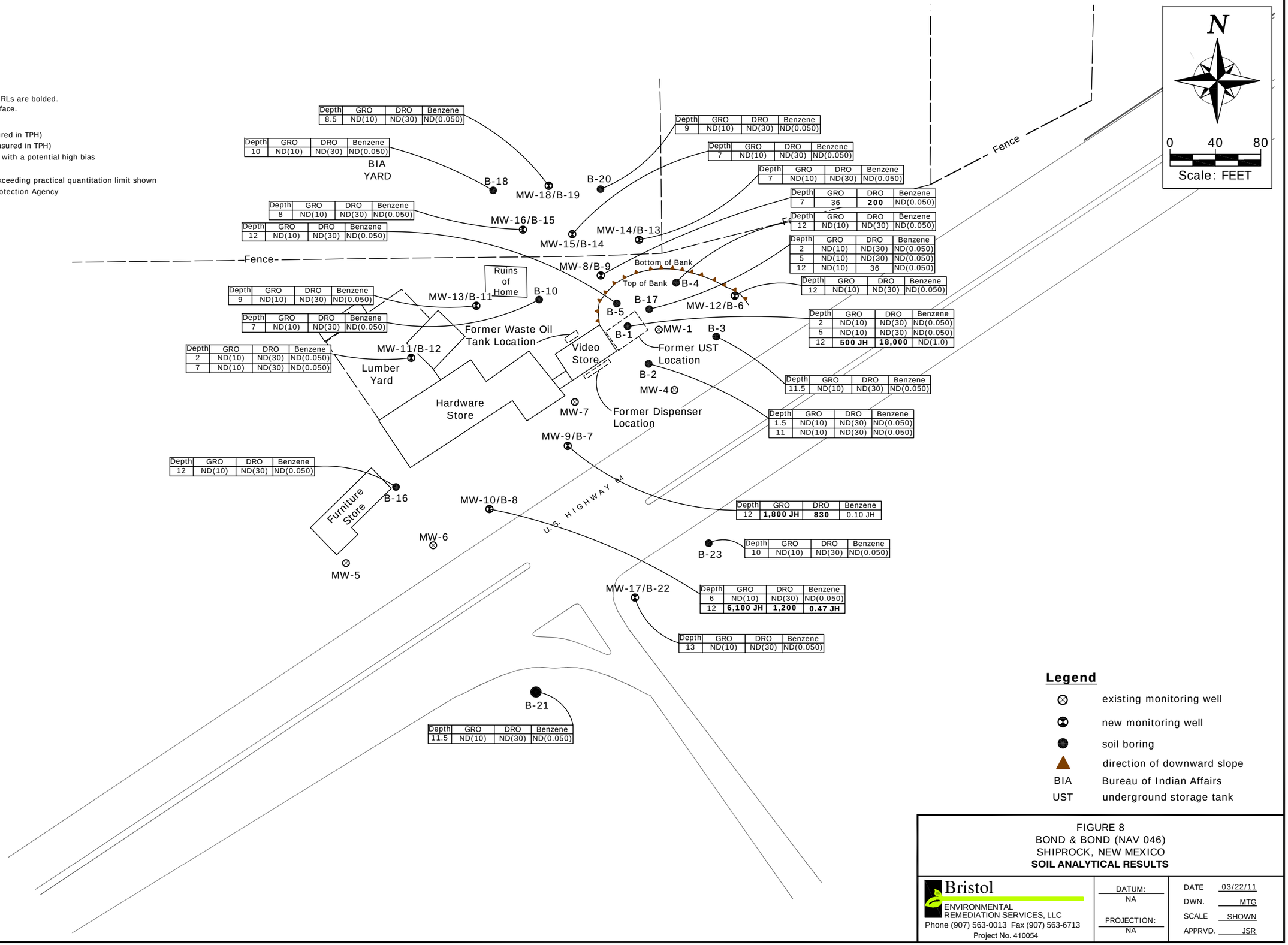
DATE 03/11/11
DWN. MTG
SCALE SHOWN
APPRVD. JSR

Soil Cleanup Levels

	NNEPA RLs (mg/kg)
Benzene	0.13
DRO	100
GRO	100

Notes: Concentrations exceeding NNEPA RLs are bolded.
Depth is in feet below ground surface.
All results shown in mg/kg.

DRO	diesel range organics (as measured in TPH)
GRO	gasoline range organics (as measured in TPH)
JH	results in an estimated quantity with a potential high bias
mg/kg	milligrams per kilogram
ND	not detected at concentration exceeding practical quantitation limit shown
NNEPA	Navajo Nation Environmental Protection Agency
RL	regulatory limit
TPH	total petroleum hydrocarbons



Depth	GRO	DRO	Benzene
8.5	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
10	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
9	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
7	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
7	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
7	36	**200**	ND(0.050)

Depth	GRO	DRO	Benzene
12	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
2	ND(10)	ND(30)	ND(0.050)
5	ND(10)	ND(30)	ND(0.050)
12	ND(10)	36	ND(0.050)

Depth	GRO	DRO	Benzene
12	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
8	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
12	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
9	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
7	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
2	ND(10)	ND(30)	ND(0.050)
7	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
2	ND(10)	ND(30)	ND(0.050)
5	ND(10)	ND(30)	ND(0.050)
12	**500 JH**	**18,000**	ND(1.0)

Depth	GRO	DRO	Benzene
11.5	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
1.5	ND(10)	ND(30)	ND(0.050)
11	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
12	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
12	**1,800 JH**	**830**	0.10 JH

Depth	GRO	DRO	Benzene
10	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
6	ND(10)	ND(30)	ND(0.050)
12	**6,100 JH**	**1,200**	**0.47 JH**

Depth	GRO	DRO	Benzene
13	ND(10)	ND(30)	ND(0.050)

Depth	GRO	DRO	Benzene
11.5	ND(10)	ND(30)	ND(0.050)

Legend

- existing monitoring well
- new monitoring well
- soil boring
- direction of downward slope
- BIA — Bureau of Indian Affairs
- UST — underground storage tank

FIGURE 8
BOND & BOND (NAV 046)
SHIPROCK, NEW MEXICO
SOIL ANALYTICAL RESULTS

Bristol
ENVIRONMENTAL REMEDIATION SERVICES, LLC
Phone (907) 563-0013 Fax (907) 563-6713
Project No. 410054

DATUM: NA
PROJECTION: NA
DATE 03/22/11
DWN. MTG
SCALE SHOWN
APPRVD. JSR